



Missouri Department of Transportation

Bridge Division

Bridge Design Manual

Section 2.2 & 2.3

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November 1, 1961

SECTION 2.2

REFERENCE PLANS AND TYPE BOOK INDEX

All bridges and special structures designed in this office are now being recorded in a new type book. Consultant designs are recorded in the back of this book. Copies of this book along with an index of reference plans and type book will be placed at each stack of reference books. Data on structures will be entered in the type book in two stages.

The first entry will be when design is initiated.

The second entry, indicated by a date in the Letting Date column, will be when the structure is let. At this time reduced copies of the design plans will be placed in the reference books.

Location of the computations or details, of plans entered in the type book but not let, can be determined by consulting Mr. Bryant.

The reference books will contain all CURRENT bridge plans. In order for all personnel to obtain the most benefit from these references it is requested that NONE of the sets of plans be removed from the books. Extra copies may be available in the Development Section. Copies of any set of plans required for extended reference may be obtained by having the originals reproduced.

REFERENCE PLANS AND TYPE BOOK INDEX

BOX CULVERTS

- 21. Single Box Culverts
- 22. Double Box Culverts (1-Lane H15)
- 22.1 Double Box Culverts (H15, H20, H20-S16) No. Trans. Joints.
- 22.2 Double Box Culverts (H15, H20, H20-S16) Trans. Joints
- 23. Triple Box Culverts (1-Lane H15).
- 23.1 Triple Box Culverts (H15, H20, H20-S16)

STEEL STRUCTURES

- 40. Simple WF Beam Spans (1-Lane H15)
- 40.1 Simple WF Beam Spans (H15, H20, H20-S16)
- 41. Continuous WF Beam Spans (1-Lane H15) Stream Crossing
- 41.1 Continuous WF Beam Spans (H15, H20, H20-S16) Stream Crossing
- 41.2 Continuous WF Beam Spans (20' Thru 28' Rdwy.) Grade Separation
- 41.3 Continuous WF Beam Spans (Dual & Miscellaneous Rdwy.) Grade Separation
- 42. Plate Girders (Stream Crossing)
- 42.1 Plate Girders (Grade Separation)

CONCRETE STRUCTURES

- 50. Deck Girders
- 51. Precast Slabs
- 52. Continuous Concrete Slabs (20' Thru 28' Rdwy.)
- 52.1 Continuous Concrete Slabs (Dual & Miscellaneous Rdwy.)
- 53. Box Girders
- 54. Rigid Frames
- 55. Prestressed Concrete

SPECIAL STRUCTURES

- 60. Trusses
- 61. Pedestrian Overpasses
- 61.1 Pedestrian Underpasses
- 62. Retaining Walls
- 63. Miscellaneous Structures

Superstructure - Special Features

Substructure - Special Features

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C - COMPUTATIONS AND DRAWINGS

INDEX

1. COMPUTATIONS

C1.1 thru C1.12 Standard Detail Sketches
C1.13 thru C1.15 Design Data Sheets

2. DRAWINGS

C2.1 Methods Available
C2.2 Limitations
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C2.4 Pencils, Corrections, etc.
C2.5 Exceptions

3. DEVELOPED PLAN SHEETS

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C3.3 Index

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C2 - DRAWINGS

C2.1 Methods Available

- a. Pencil Linen
- b. Brown Lines
 - (1) Developed Plan Sheets (See C3)
 - (2) Made from Nearly Identical Sheets
- c. Photographic Process
 - (1) Developed Plan Sheets (See C3.2)
 - Reflex Prints
 - Contact Prints
 - (2) Stickups and New Drawings
 - Reflex of Complete Stickup
 - Reflex of Partial Stickup

C2.2 Limitations on Use of Each Method

a. Pencil Linen - To be used when no possible use can be made of developed plan sheets, available stickups, and part or all of previous bridge plans. When all details for a particular sheet must be drawn they should be placed on pencil linen.

b. Brown Lines

(1) Developed Plan Sheets. For sheets requiring less than one hour of inking, brown lines should be used. Examples of such sheets would be: Rail or bearing sheets with no additional details to be added, superstructure of precast bridges, and some slab sheets for continuous WF-beam spans.

(2) When sheets which are nearly identical to that required are available from previous bridge plans, and the amount of inking required to modify same is limited, brown lines should be used.

c. Photographic Process

Definitions:

Contact Print - Reproduction of pencil linen or brown line original. (Transparent)

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Reflex Print - Reproduction of black and white original. (Opaque)

Stickup - Black and white prints of any detail or note (note book standards, black and white from bridge plans, etc.) which are assembled and placed on previously prepared black and white background sheets.

(1) Developed Plan Sheets. For sheets requiring no stickups and an appreciable amount of lettering and detailing, contact prints will be made available and the detailing will be done on the film. When stickups are required they should be placed on the background sheet which will be reflexed. The remaining detail work will be done with plastic pencil on the reflex print.

(2) Stickups and New Drawings. For sheets where some stickups are available but all additional details must be drawn, the choice of detailing on a black and white background sheet or on a reflex print of the assembled background sheet with stickups will depend on individual circumstances.

In cases where detailing is done on black and white background sheets, reflex prints shall be made and both turned in for checking with the remainder of sheets. Background sheets shall not be discarded until the job is completely checked out.

C2.3 Determination of Method

The designer and/or detailer should prepare a layout of the arrangement of details required for a job and assemble, when possible, stickup material of nearly identical bridge plans. The Development Section will provide the necessary developed plan sheets, brown lines, prints, and additional stickups. Any aid required in determining the most advantageous method of detailing or in suggesting improvements or changes in the proposed layout of sheets will be available.

C2.4 Pencils, Corrections, etc.

a. Photographic Prints - Work on the film should be done with plastic pencils except for minute details such as rivets and for titles for which "Wrico" guides are used, in which cases the use of india ink is indicated.

Corrections of original material on the film must be made on the reverse side. Use "brown line" eradicator or No. 3837 pink eraser in an erasing machine.

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Corrections of work done on the front side with plastic pencils can be made with any soft eraser or with a moist (water) swab. Ink can be removed with a hard eraser or water. When water is used it must be allowed to dry sufficiently before resuming work.

b. Black and White Stickups - Choice of pencil is optional. Corrections or changes can be made with "brown line" eradicator.

c. Attaching Stickups - Glue pens, which should be used sparingly, are available. Any type of tape will work satisfactorily and will not reproduce.

C2.5 Exceptions

At the present time capacity of the "Contact Printer" is limited and some details which logically would be produced on film must remain on brown lines. We will, until capacity is available, use brown lines for most culverts and many sheets where no stickups are involved. Consult the Development Section and/or supervisor for proper method to use.

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C3 - DEVELOPED PLAN SHEETS

Prints of all Developed Plan Sheets (brown lines) in general use have been assembled and bound and are available for general use in the Development Section. The following index of these sheets has been compiled and both will be kept as up to date as possible. The suggested uses of the index and prints are:

a. Designers and/or detailers may determine which sheets will adapt to their particular jobs and request prints of same from the Development Section by number.

b. All changes of or additions to the developed plan sheets will be noted on the assembled prints of same. Detailers or checkers will be able to determine the current correct details by referring to the prints.

c. Variations or modifications of any of the available sheets can be made and some sheets of a special nature can be obtained or developed on request.

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DEVELOPED PLAN SHEETS

GENERAL INDEX

HANDRAIL

1. Handrail, 12" Channel
2. Handrail, 6" Channel (Not Available)
3. Handrail, Aluminum

BEARINGS

4. Bearings and Expansion Devices, Steel Structures
5. Bearings, Deck Girder
- 6.
- 7.

SUBSTRUCTURE - STEEL BRIDGES

8. Pile Cap End Bent Only
9. Pile Cap End Bent and Pile Cap Int. Bents
10. Pile Cap End Bent and Open Concrete Int. Bents
11. Pile Cap End Bent with Fixed End (Not Available)
- 12.
- 13.
14. 2 Column, Open Concrete End Bent Only
15. 2 Column, Open Concrete End Bent and Int. Bent
16. 3 Column, Open Concrete End Bent Only
17. 3 Column, Open Concrete End Bent with 2 or 3 Col. Int. Bt.
18. 2 or 3 Square Column, Open Concrete Int. Bents
19. 2 Round Column, Open Concrete Int. Bents
20. Dumbbell Piers

Note: For Precast Spans, Continuous Slabs and Deck Girders
See Superstructure.

BOX CULVERTS WITH FLOOR

21. Single Box
22. Double Box
23. Triple Box
24. Single Box with Counterforts
25. Double Box with Counterforts
26. Triple Box with Counterforts

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General Index (Continued)

BOX CULVERTS NO FLOOR

- 27. Single Box
- 28. Double Box
- 29. Triple Box
- 30. Single Bcx with Counterforts
- 31. Double Box with Counterforts
- 32. Triple Box with Counterforts
- 33.
- 34.
- 35.
- 36.
- 37.
- 38.
- 39.

SUPERSTRUCTURE

- 40. Simple WF Beam Spans
- 41. Continuous WF Beam Spans
- 42. Plate Girder Spans

- 50. Deck Girder Spans (Substructure and Superstructure)
- 51. Precast Slab Spans (First Sheets, Substr. & Superstr.)
- 52. Continuous Slab Spans (Substructure Only)

- 60. Trusses

- 90. Bar Bills